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(54) **VARIABLE METAL MULTI-GATE METAL OXIDE SEMICONDUCTOR CAPACITOR RADIATION SENSOR FOR IMPROVED GAIN AND TISSUE EQUIVALENCE**

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CPC ***G01T 1/026*** (2013.01); ***G01T 7/00*** (2013.01); ***G01T 7/005*** (2013.01);
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(58) **Field of Classification Search**
CPC H01L 31/115; H01L 28/40; G01T 1/026
See application file for complete search history.

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(57) **ABSTRACT**

A method and apparatus is disclosed for differentially altering the radiation response across multiple MOSCAP sensors by placing different thin gate materials with different atomic numbers on a series of MOS-based radiation sensors. The secondary electrons created in high-atomic weight materials (such as gold) at lower incident photon energy levels enable a tissue equivalent radiation response and radiations source identification/differentiation. This is a desirable alternative to using filters with different coefficients across a series of MOSCAP radiation sensor which will attenuate the signal and degrade the device form factor. The method and apparatus disclosed achieves the same functionality but with inherent gain instead of attenuation, thus increasing sensitivity. This will improve the minimum resolvable dose for

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